



SEQUENCE LISTING

<110> Bertin, John

<120> NOVEL MOLECULES OF THE NBS/LRR PROTEIN FAMILY AND USES THEREOF

<130> 07334-268001

<140> US 09/848,035

<141> 2001-05-03

<150> US 60/201,464

<151> 2000-05-03

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<170> FastSEQ for Windows Version 4.0

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<211> 2464

<212> DNA

<213> Homo sapiens

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<221> CDS

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ctg aac gag gat gaa tta aag agt ttc aaa tcc ctt tta tgg gct ttt 96
Leu Asn Glu Asp Glu Leu Lys Ser Phe Lys Ser Leu Leu Trp Ala Phe
20 25 30

ccc ctc gaa gac gtg cta cag aag acc cca tgg tct gag gtg gaa gag 144
Pro Leu Glu Asp Val Leu Gln Lys Thr Pro Trp Ser Glu Val Glu Glu
35 40 45

gct gat ggc aag aaa ctg gca gaa att ctg gtc aac acc tcc tca gaa 192
Ala Asp Gly Lys Lys Leu Ala Glu Ile Leu Val Asn Thr Ser Ser Glu
50 55 60

aat tgg ata agg aat gcg act gtg aac atc ttg gaa gag atg aat ctc 240
Asn Trp Ile Arg Asn Ala Thr Val Asn Ile Leu Glu Glu Met Asn Leu
65 70 75 80

acg gaa ttg tgt aag atg gca aag gct gag atg atg gag gac gga cag 288
Thr Glu Leu Cys Lys Met Ala Lys Ala Glu Met Met Glu Asp Gly Gln
85 90 95

gtg caa gaa ata gat aat cct gag ctg gga gat gca gaa gaa gac tcg 336
Val Gln Glu Ile Asp Asn Pro Glu Leu Gly Asp Ala Glu Glu Asp Ser
100 105 110

A1

gag tta gca aag cca ggt gaa aag gaa gga tgg aga aat tca atg gag	384
Glu Leu Ala Lys Pro Gly Glu Lys Glu Gly Trp Arg Asn Ser Met Glu	
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aaa caa tct ttg gtc tgg aag aac acc ttt tgg caa gga gac att gac	432
Lys Gln Ser Leu Val Trp Lys Asn Thr Phe Trp Gln Gly Asp Ile Asp	
130 135 140	
aat ttc cat gac gac gtc act ctg aga aac caa cgg ttc att cca ttc	480
Asn Phe His Asp Asp Val Thr Leu Arg Asn Gln Arg Phe Ile Pro Phe	
145 150 155 160	
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Leu Asn Pro Arg Thr Pro Arg Lys Leu Thr Pro Tyr Thr Val Val Leu	
165 170 175	
cac ggc ccc gca ggc gtg ggg aaa acc acg ctg gcc aaa aag tgt atg	576
His Gly Pro Ala Gly Val Gly Lys Thr Thr Leu Ala Lys Lys Cys Met	
180 185 190	
ctg gac tgg aca gac tgc aac ctc agc ccg acg ctc aga tac gcg ttc	624
Leu Asp Trp Thr Asp Cys Asn Leu Ser Pro Thr Leu Arg Tyr Ala Phe	
195 200 205	
tac ctc agc tgc aag gag ctc agc cgc atg ggc ccc tgc agt ttt gca	672
Tyr Leu Ser Cys Lys Glu Leu Ser Arg Met Gly Pro Cys Ser Phe Ala	
210 215 220	
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Glu Leu Ile Ser Lys Asp Trp Pro Glu Leu Gln Asp Asp Ile Pro Ser	
225 230 235 240	
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Ile Leu Ala Gln Ala Gln Arg Ile Leu Phe Val Val Asp Gly Leu Asp	
245 250 255	
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Glu Leu Lys Val Pro Pro Gly Ala Leu Ile Gln Asp Ile Cys Gly Asp	
260 265 270	
tgg gag aag aag aag ccg gtg ccc gtc ctc ctg ggg agt ttg ctg aag	864
Trp Glu Lys Lys Lys Pro Val Pro Val Leu Leu Gly Ser Leu Leu Lys	
275 280 285	
agg aag atg tta ccc agg gca gcc ttg ctg gtc acc acg cgg ccc agg	912
Arg Lys Met Leu Pro Arg Ala Ala Leu Leu Val Thr Thr Arg Pro Arg	
290 295 300	
gca ctg agg gac ctc cag ctc ctg gcg cag cag ccg atc tac ata agg	960
Ala Leu Arg Asp Leu Gln Leu Leu Ala Gln Gln Pro Ile Tyr Ile Arg	
305 310 315 320	
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Val Glu Gly Phe Leu Glu Glu Asp Arg Arg Ala Tyr Phe Leu Arg His	
325 330 335	

A1

ttt gga gac gag gac caa gcc atg cgt gcc ttt gag cta atg agg agc	1056
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Asn Ala Ala Leu Phe Gln Leu Gly Ser Ala Pro Ala Val Cys Trp Ile	
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Val Cys Thr Thr Leu Lys Leu Gln Met Glu Lys Gly Glu Asp Pro Pro	
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Val Pro Ala Gly Arg Thr Ala Ala Gly Arg Ala Ala Asp Ala Glu Pro	
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Pro Gly Arg Ala Gly Leu Trp Ala Gln Met Ser Val Phe His Arg Glu	
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Asp Leu Glu Arg Leu Gly Val Gln Glu Ser Asp Leu Arg Leu Phe Leu	
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435 440 445	
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Phe Ile His Leu Ser Phe Gln Gln Phe Leu Thr Ala Leu Phe Tyr Ala	
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Gly Asp Val Gln Lys Leu Leu Ser Gly Glu Glu Arg Leu Lys Asn Pro	
485 490 495	
gac ctg att caa gta gga cac ttc tta ttc ggc ctc gct aac gag aag	1536
Asp Leu Ile Gln Val Gly His Phe Leu Phe Gly Leu Ala Asn Glu Lys	
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aga gcc aag gag ttg gag gcc act ttt ggc tgc cgg atg tca ccg gac	1584
Arg Ala Lys Glu Leu Glu Ala Thr Phe Gly Cys Arg Met Ser Pro Asp	
515 520 525	
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Ile Lys Gln Glu Leu Leu Gln Cys Lys Ala His Leu His Ala Asn Lys	
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545 550 555 560	

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Ser Gln Glu Glu Glu Leu Ala Lys Val Val Val Ala Pro Phe Lys Glu	
565 570 575	
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Ile Ser Ile His Leu Thr Asn Thr Ser Glu Val Met His Cys Ser Phe	
580 585 590	
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Ser Leu Lys His Cys Gln Asp Leu Gln Lys Leu Ser Leu Gln Val Ala	
595 600 605	
aag ggg gtg ttc ctg gag aat tac atg gat ttt gaa ctg gac att gaa	1872
Lys Gly Val Phe Leu Glu Asn Tyr Met Asp Phe Glu Leu Asp Ile Glu	
610 615 620	
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625 630 635 640	
ttc ctg agt gac tct tct gtg cgg att ctt tgt gac cac gta acc cgt	1968
Phe Leu Ser Asp Ser Ser Val Arg Ile Leu Cys Asp His Val Thr Arg	
645 650 655	
agc acc tgt cat ctg cag aaa gtg gag att aaa aac gtc acc cct gac	2016
Ser Thr Cys His Leu Gln Lys Val Glu Ile Lys Asn Val Thr Pro Asp	
660 665 670	
acc gcg tac cgg gac ttc tgt ctt gct ttc att ggg aag aag acc ctc	2064
Thr Ala Tyr Arg Asp Phe Cys Leu Ala Phe Ile Gly Lys Lys Thr Leu	
675 680 685	
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Thr His Leu Thr Leu Ala Gly His Ile Glu Trp Glu Arg Thr Met Met	
690 695 700	
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Leu Met Leu Cys Asp Leu Leu Arg Asn His Lys Cys Asn Leu Gln Tyr	
705 710 715 720	
ctg agg ttg gga ggt cac tgt gcc acc ccg gag cag tgg gct gaa ttc	2208
Leu Arg Leu Gly Gly His Cys Ala Thr Pro Glu Gln Trp Ala Glu Phe	
725 730 735	
ttc tat gtc ctc aaa gcc aac cag tcc ctg aag cac ctg cgt ctc tca	2256
Phe Tyr Val Leu Lys Ala Asn Gln Ser Leu Lys His Leu Arg Leu Ser	
740 745 750	
gcc aat gtg ctc ctg gat gag ggt gcc atg ttg ctg tac aag acc atg	2304
Ala Asn Val Leu Leu Asp Glu Gly Ala Met Leu Leu Tyr Lys Thr Met	
755 760 765	
aca cgc cca aaa cac ttc ctg cag atg ttg tcg ttg gaa aac tgt cgt	2352
Thr Arg Pro Lys His Phe Leu Gln Met Leu Ser Leu Glu Asn Cys Arg	
770 775 780	

A1

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 785 790 795 800

aag aag ctg aca cac ctg tgc ttg gcc aag aac ccc att ggg gat aca 2448
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 Pro Leu Glu Asp Val Leu Gln Lys Thr Pro Trp Ser Glu Val Glu Glu
 35 40 45
 Ala Asp Gly Lys Lys Leu Ala Glu Ile Leu Val Asn Thr Ser Ser Glu
 50 55 60
 Asn Trp Ile Arg Asn Ala Thr Val Asn Ile Leu Glu Glu Met Asn Leu
 65 70 75 80
 Thr Glu Leu Cys Lys Met Ala Lys Ala Glu Met Met Glu Asp Gly Gln
 85 90 95
 Val Gln Glu Ile Asp Asn Pro Glu Leu Gly Asp Ala Glu Glu Asp Ser
 100 105 110
 Glu Leu Ala Lys Pro Gly Glu Lys Glu Gly Trp Arg Asn Ser Met Glu
 115 120 125
 Lys Gln Ser Leu Val Trp Lys Asn Thr Phe Trp Gln Gly Asp Ile Asp
 130 135 140
 Asn Phe His Asp Asp Val Thr Leu Arg Asn Gln Arg Phe Ile Pro Phe
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 Leu Asn Pro Arg Thr Pro Arg Lys Leu Thr Pro Tyr Thr Val Val Leu
 165 170 175
 His Gly Pro Ala Gly Val Gly Lys Thr Thr Leu Ala Lys Lys Cys Met
 180 185 190
 Leu Asp Trp Thr Asp Cys Asn Leu Ser Pro Thr Leu Arg Tyr Ala Phe
 195 200 205
 Tyr Leu Ser Cys Lys Glu Leu Ser Arg Met Gly Pro Cys Ser Phe Ala
 210 215 220
 Glu Leu Ile Ser Lys Asp Trp Pro Glu Leu Gln Asp Asp Ile Pro Ser
 225 230 235 240
 Ile Leu Ala Gln Ala Gln Arg Ile Leu Phe Val Val Asp Gly Leu Asp
 245 250 255
 Glu Leu Lys Val Pro Pro Gly Ala Leu Ile Gln Asp Ile Cys Gly Asp
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 Trp Glu Lys Lys Lys Pro Val Pro Val Leu Leu Gly Ser Leu Leu Lys
 275 280 285
 Arg Lys Met Leu Pro Arg Ala Ala Leu Leu Val Thr Thr Arg Pro Arg
 290 295 300

A1

Ala Leu Arg Asp Leu Gln Leu Leu Ala Gln Gln Pro Ile Tyr Ile Arg
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 Val Glu Gly Phe Leu Glu Glu Asp Arg Arg Ala Tyr Phe Leu Arg His
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 340 345 350
 Asn Ala Ala Leu Phe Gln Leu Gly Ser Ala Pro Ala Val Cys Trp Ile
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 Val Cys Thr Thr Leu Lys Leu Gln Met Glu Lys Gly Glu Asp Pro Pro
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 Val Pro Ala Gly Arg Thr Ala Ala Gly Arg Ala Ala Asp Ala Glu Pro
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 Asp Leu Glu Arg Leu Gly Val Gln Glu Ser Asp Leu Arg Leu Phe Leu
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 Asp Gly Asp Ile Leu Arg Gln Asp Arg Val Ser Lys Gly Cys Tyr Ser
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 Asp Leu Ile Gln Val Gly His Phe Leu Phe Gly Leu Ala Asn Glu Lys
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 Arg Ala Lys Glu Leu Glu Ala Thr Phe Gly Cys Arg Met Ser Pro Asp
 515 520 525
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 Pro Leu Ser Val Thr Asp Leu Lys Glu Val Leu Gly Cys Leu Tyr Glu
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 Ser Gln Glu Glu Glu Leu Ala Lys Val Val Val Ala Pro Phe Lys Glu
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 Ile Ser Ile His Leu Thr Asn Thr Ser Glu Val Met His Cys Ser Phe
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 Ser Leu Lys His Cys Gln Asp Leu Gln Lys Leu Ser Leu Gln Val Ala
 595 600 605
 Lys Gly Val Phe Leu Glu Asn Tyr Met Asp Phe Glu Leu Asp Ile Glu
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 Phe Leu Ser Asp Ser Ser Val Arg Ile Leu Cys Asp His Val Thr Arg
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 Ser Thr Cys His Leu Gln Lys Val Glu Ile Lys Asn Val Thr Pro Asp
 660 665 670
 Thr Ala Tyr Arg Asp Phe Cys Leu Ala Phe Ile Gly Lys Lys Thr Leu
 675 680 685
 Thr His Leu Thr Leu Ala Gly His Ile Glu Trp Glu Arg Thr Met Met
 690 695 700
 Leu Met Leu Cys Asp Leu Leu Arg Asn His Lys Cys Asn Leu Gln Tyr
 705 710 715 720
 Leu Arg Leu Gly Gly His Cys Ala Thr Pro Glu Gln Trp Ala Glu Phe
 725 730 735
 Phe Tyr Val Leu Lys Ala Asn Gln Ser Leu Lys His Leu Arg Leu Ser
 740 745 750

A1

Ala Asn Val Leu Leu Asp Glu Gly Ala Met Leu Leu Tyr Lys Thr Met
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 Thr Arg Pro Lys His Phe Leu Gln Met Leu Ser Leu Glu Asn Cys Arg
 770 775 780
 Leu Thr Glu Ala Ser Cys Lys Asp Leu Ala Ala Val Leu Val Val Ser
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 Asn Leu Ser Asp Lys Glu Phe Gln Ser Phe Lys Lys Tyr Leu Ala Arg
 20 25 30
 aag att ctt gat ttc aaa ctg cca cag ttt cca ctg ata cag atg aca 144
 Lys Ile Leu Asp Phe Lys Leu Pro Gln Phe Pro Leu Ile Gln Met Thr
 35 40 45
 aaa gaa gaa ctg gct aac gtg ttg cca atc tct tat gag gga cag tat 192
 Lys Glu Glu Leu Ala Asn Val Leu Pro Ile Ser Tyr Glu Gly Gln Tyr
 50 55 60
 ata tgg aat atg ctc ttc agc ata ttt tca atg atg cgt aag gaa gat 240
 Ile Trp Asn Met Leu Phe Ser Ile Phe Ser Met Met Arg Lys Glu Asp
 65 70 75 80
 ctt tgt agg aag atc att ggc aga cga aac cat gtg ttc tac ata ctt 288
 Leu Cys Arg Lys Ile Ile Gly Arg Arg Asn His Val Phe Tyr Ile Leu
 85 90 95
 caa tta gcc tat gat tct acc agc tat tat tca gca aac aat ctc aat 336
 Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn
 100 105 110
 gtg ttc ctg atg gga gag aga gca tct gga aaa act att gtt ata aat 384
 Val Phe Leu Met Gly Glu Arg Ala Ser Gly Lys Thr Ile Val Ile Asn
 115 120 125
 ctg gct gtg ttg agg tgg atc aag ggt gag atg tgg cag aac atg atc 432
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 130 135 140

tcg tac gtc gtt cac ctc act gct cac gaa ata aac cag atg acc aac 480
 Ser Tyr Val Val His Leu Thr Ala His Glu Ile Asn Gln Met Thr Asn
 145 150 155 160

agc agc ttg gct gag cta atc gcc aag gac tgg cct gac ggc cag gct 528
 Ser Ser Leu Ala Glu Leu Ile Ala Lys Asp Trp Pro Asp Gly Gln Ala
 165 170 175

ccc att gca gac atc ctg tct gat ccc aag aaa ctc ctt ttc atc ctc 576
 Pro Ile Ala Asp Ile Leu Ser Asp Pro Lys Lys Leu Leu Phe Ile Leu
 180 185 190

gag gac ttg gac aac ata aga ttc gag tta aat gtc aat gaa agt gct 624
 Glu Asp Leu Asp Asn Ile Arg Phe Glu Leu Asn Val Asn Glu Ser Ala
 195 200 205

ttg tgt agt aac agc acc cag aaa gtt ccc att cca gtt ctc ctg gtc 672
 Leu Cys Ser Asn Ser Thr Gln Lys Val Pro Ile Pro Val Leu Leu Val
 210 215 220

agt ttg ctg aag aga aaa atg gct cca ggc tgc tgg ttc ctc atc tcc 720
 Ser Leu Leu Lys Arg Lys Met Ala Pro Gly Cys Trp Phe Leu Ile Ser
 225 230 235 240

tca agg ccc aca cgt ggg aat aat gta aaa acg ttc ttg aaa gag gta 768
 Ser Arg Pro Thr Arg Gly Asn Asn Val Lys Thr Phe Leu Lys Glu Val
 245 250 255

gat tgc tgc acg acc ttg cag ctg tcg aat ggg aag agg gag ata tat 816
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 260 265 270

ttt aac tct ttc ttt aaa gac cgc cag agg gcg tcg gca gcc ctc cag 864
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 290 295 300

tta tgc tgg atc acg tgt act gtc ctg aag cgg cag atg gac aag ggg 960
 Leu Cys Trp Ile Thr Cys Thr Val Leu Lys Arg Gln Met Asp Lys Gly
 305 310 315 320

cgt gac ttc cag ctc tgc tgc caa aca ccc act gat cta cat gcc cac 1008
 Arg Asp Phe Gln Leu Cys Cys Gln Thr Pro Thr Asp Leu His Ala His
 325 330 335

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 Phe Leu Ala Asp Ala Leu Thr Ser Glu Ala Gly Leu Thr Ala Asn Gln
 340 345 350

tat cac cta ggt ctc cta aaa cgt ctg tgt ttg ctg gct gca gga gga 1104
 Tyr His Leu Gly Leu Leu Lys Arg Leu Cys Leu Leu Ala Ala Gly Gly
 355 360 365

A1

ctg ttt ctg agc acc ctg aat ttc agt ggt gaa gac ctc aga tgt gtt 1152
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 370 375 380

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 385 390 395 400

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 405 410 415

gtc cag gag ttt tgt aca gcc att gca ttt ctg atg gca gta ccc aac 1296
 Val Gln Glu Phe Cys Thr Ala Ile Ala Phe Leu Met Ala Val Pro Asn
 420 425 430

tat ctg atc ccc tca ggc agc aga gag tat aaa gag aag aga gaa caa 1344
 Tyr Leu Ile Pro Ser Gly Ser Arg Glu Tyr Lys Glu Lys Arg Glu Gln
 435 440 445

tac tct gac ttt aat caa gtg ttt act ttc att ttt ggt ctt cta aat 1392
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 465 470 475 480

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 Met Val Asp Ser Phe Lys Trp Tyr Ser Val Gly Tyr Met Lys His Leu
 485 490 495

gac cgt gac ccg gaa aag ttg acg cac cat atg cct ttg ttt tac tgt 1536
 Asp Arg Asp Pro Glu Lys Leu Thr His His Met Pro Leu Phe Tyr Cys
 500 505 510

ctc tat gag aat cgg gaa gaa gaa ttt gtg aag acg att gtg gat gct 1584
 Leu Tyr Glu Asn Arg Glu Glu Glu Phe Val Lys Thr Ile Val Asp Ala
 515 520 525

ctc atg gag gtt aca gtt tac ctt caa tca gac aag gat atg atg gtc 1632
 Leu Met Glu Val Thr Val Tyr Leu Gln Ser Asp Lys Asp Met Met Val
 530 535 540

tca tta tac tgt ctg gat tac tgc tgt cac ctg agg aca ctt aag ttg 1680
 Ser Leu Tyr Cys Leu Asp Tyr Cys Cys His Leu Arg Thr Leu Lys Leu
 545 550 555 560

agt gtt cag cgc atc ttt caa aac aaa gag cca ctt ata agg cca act 1728
 Ser Val Gln Arg Ile Phe Gln Asn Lys Glu Pro Leu Ile Arg Pro Thr
 565 570 575

gct agt caa atg aag agc ctt gtc tac tgg aga gag atc tgc tct ctt 1776
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 580 585 590

A1

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 595 600 605

ctt aat ggt att tca gaa agg att ctg tct aaa gcc ctg gag cat tct 1872
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 Ser Cys Lys Leu Arg Thr Leu
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<210> 4
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 35 40 45
 Lys Glu Glu Leu Ala Asn Val Leu Pro Ile Ser Tyr Glu Gly Gln Tyr
 50 55 60
 Ile Trp Asn Met Leu Phe Ser Ile Phe Ser Met Met Arg Lys Glu Asp
 65 70 75 80
 Leu Cys Arg Lys Ile Ile Gly Arg Arg Asn His Val Phe Tyr Ile Leu
 85 90 95
 Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn
 100 105 110
 Val Phe Leu Met Gly Glu Arg Ala Ser Gly Lys Thr Ile Val Ile Asn
 115 120 125
 Leu Ala Val Leu Arg Trp Ile Lys Gly Glu Met Trp Gln Asn Met Ile
 130 135 140
 Ser Tyr Val Val His Leu Thr Ala His Glu Ile Asn Gln Met Thr Asn
 145 150 155 160
 Ser Ser Leu Ala Glu Leu Ile Ala Lys Asp Trp Pro Asp Gly Gln Ala
 165 170 175
 Pro Ile Ala Asp Ile Leu Ser Asp Pro Lys Lys Leu Leu Phe Ile Leu
 180 185 190
 Glu Asp Leu Asp Asn Ile Arg Phe Glu Leu Asn Val Asn Glu Ser Ala
 195 200 205
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 210 215 220
 Ser Leu Leu Lys Arg Lys Met Ala Pro Gly Cys Trp Phe Leu Ile Ser
 225 230 235 240
 Ser Arg Pro Thr Arg Gly Asn Asn Val Lys Thr Phe Leu Lys Glu Val
 245 250 255
 Asp Cys Cys Thr Thr Leu Gln Leu Ser Asn Gly Lys Arg Glu Ile Tyr
 260 265 270
 Phe Asn Ser Phe Phe Lys Asp Arg Gln Arg Ala Ser Ala Ala Leu Gln
 275 280 285
 Leu Val His Glu Asp Glu Ile Leu Val Gly Leu Cys Arg Val Ala Ile
 290 295 300

A1

Leu Cys Trp Ile Thr Cys Thr Val Leu Lys Arg Gln Met Asp Lys Gly
 305 310 315 320
 Arg Asp Phe Gln Leu Cys Cys Gln Thr Pro Thr Asp Leu His Ala His
 325 330 335
 Phe Leu Ala Asp Ala Leu Thr Ser Glu Ala Gly Leu Thr Ala Asn Gln
 340 345 350
 Tyr His Leu Gly Leu Leu Lys Arg Leu Cys Leu Leu Ala Ala Gly Gly
 355 360 365
 Leu Phe Leu Ser Thr Leu Asn Phe Ser Gly Glu Asp Leu Arg Cys Val
 370 375 380
 Gly Phe Thr Glu Ala Asp Val Ser Val Leu Gln Ala Ala Asn Ile Leu
 385 390 395 400
 Leu Pro Ser Asn Thr His Lys Asp Arg Tyr Lys Phe Ile His Leu Asn
 405 410 415
 Val Gln Glu Phe Cys Thr Ala Ile Ala Phe Leu Met Ala Val Pro Asn
 420 425 430
 Tyr Leu Ile Pro Ser Gly Ser Arg Glu Tyr Lys Glu Lys Arg Glu Gln
 435 440 445
 Tyr Ser Asp Phe Asn Gln Val Phe Thr Phe Ile Phe Gly Leu Leu Asn
 450 455 460
 Ala Asn Arg Arg Lys Ile Leu Glu Thr Ser Phe Gly Tyr Gln Leu Pro
 465 470 475 480
 Met Val Asp Ser Phe Lys Trp Tyr Ser Val Gly Tyr Met Lys His Leu
 485 490 495
 Asp Arg Asp Pro Glu Lys Leu Thr His Met Pro Leu Phe Tyr Cys
 500 505 510
 Leu Tyr Glu Asn Arg Glu Glu Glu Phe Val Lys Thr Ile Val Asp Ala
 515 520 525
 Leu Met Glu Val Thr Val Tyr Leu Gln Ser Asp Lys Asp Met Met Val
 530 535 540
 Ser Leu Tyr Cys Leu Asp Tyr Cys Cys His Leu Arg Thr Leu Lys Leu
 545 550 555 560
 Ser Val Gln Arg Ile Phe Gln Asn Lys Glu Pro Leu Ile Arg Pro Thr
 565 570 575
 Ala Ser Gln Met Lys Ser Leu Val Tyr Trp Arg Glu Ile Cys Ser Leu
 580 585 590
 Phe Tyr Thr Met Glu Ser Leu Arg Glu Leu His Ile Phe Asp Asn Asp
 595 600 605
 Leu Asn Gly Ile Ser Glu Arg Ile Leu Ser Lys Ala Leu Glu His Ser
 610 615 620
 Ser Cys Lys Leu Arg Thr Leu
 625 630

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 <213> Homo sapiens

<220>
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 <222> (1)...(1563)

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 Met Lys Ala Glu Leu Leu Glu Thr Trp Asp Asn Ile Ser Trp Pro Lys
 1 5 10 15

gac cac gta tat atc cgt aat aca tca aag gac gaa cat gag gaa ctg Asp His Val Tyr Ile Arg Asn Thr Ser Lys Asp Glu His Glu Glu Leu 20 25 30	96
cag cgc cta ctg gat cct aat agg act aga gcc cag gcc cag acg ata Gln Arg Leu Leu Asp Pro Asn Arg Thr Arg Ala Gln Ala Gln Thr Ile 35 40 45	144
gtc ttg gtg ggg agg gca ggg gtt ggg aag acc acc ttg gca atg cag Val Leu Val Gly Arg Ala Gln Val Gly Lys Thr Thr Leu Ala Met Gln 50 55 60	192
gct atg ctg cac tgg gca aat gga gtt ctc ttt cag caa agg ttc tcc Ala Met Leu His Trp Ala Asn Gly Val Leu Phe Gln Gln Arg Phe Ser 65 70 75 80	240
tat gtt ttc tat ctc agc tgc cat aaa ata agg tac atg aag gaa act Tyr Val Phe Tyr Leu Ser Cys His Lys Ile Arg Tyr Met Lys Glu Thr 85 90 95	288
acc ttt gct gaa ttg att tct ttg gat tgg ccc gat ttt gat gcc ccc Thr Phe Ala Glu Leu Ile Ser Leu Asp Trp Pro Asp Phe Asp Ala Pro 100 105 110	336
att gaa gag ttc atg tct caa cca gag aag ctc ctg ttt att att gat Ile Glu Glu Phe Met Ser Gln Pro Glu Lys Leu Leu Phe Ile Ile Asp 115 120 125	384
ggc ttt gag gaa ata atc ata tct gag tca cgc tct gag agc ttg gat Gly Phe Glu Glu Ile Ile Ile Ser Glu Ser Arg Ser Glu Ser Leu Asp 130 135 140	432
gat ggc tcg cca tgt aca gac tgg tac cag gag ctc cca gtg acc aaa Asp Gly Ser Pro Cys Thr Asp Trp Tyr Gln Glu Leu Pro Val Thr Lys 145 150 155 160	480
atc cta cac agc ttg ttg aag aaa gaa ttg gtt ccc ctg gct acc tta Ile Leu His Ser Leu Leu Lys Lys Glu Leu Val Pro Leu Ala Thr Leu 165 170 175	528
ctg atc acg atc aag acc tgg ttt gtg aga gat ctt aag gcc tca tta Leu Ile Thr Ile Lys Thr Trp Phe Val Arg Asp Leu Lys Ala Ser Leu 180 185 190	576
gtg aat cca tgc ttt gta caa att aca ggg ttc aca ggg gac gac cta Val Asn Pro Cys Phe Val Gln Ile Thr Gly Phe Thr Gly Asp Asp Leu 195 200 205	624
cgg gta tat ttc atg aga cac ttt gat gac tca agt gaa gtt gag aaa Arg Val Tyr Phe Met Arg His Phe Asp Asp Ser Ser Glu Val Glu Lys 210 215 220	672
atc ctg cag cag cta aga aaa aac gaa act ctc ttt cat tcc tgc agt Ile Leu Gln Gln Leu Arg Lys Asn Glu Thr Leu Phe His Ser Cys Ser 225 230 235 240	720

A1

gcc ccc atg gtg tgt tgg acc gta tgt tcc tgt ctg aag cag ccg aag 768
 Ala Pro Met Val Cys Trp Thr Val Cys Ser Cys Leu Lys Gln Pro Lys
 245 250 255

gtg agg tat tac gat ctc cag tca atc act cag act acc acc agt ctg 816
 Val Arg Tyr Tyr Asp Leu Gln Ser Ile Thr Gln Thr Thr Thr Ser Leu
 260 265 270

tat gcc tat ttt ttc tcc aac ttg ttc tcc aca gca gag gta gat ttg 864
 Tyr Ala Tyr Phe Phe Ser Asn Leu Phe Ser Thr Ala Glu Val Asp Leu
 275 280 285

gca gat gac agc tgg cca gga caa tgg agg gcc ctc tgc agt ctg gcc 912
 Ala Asp Asp Ser Trp Pro Gly Gln Trp Arg Ala Leu Cys Ser Leu Ala
 290 295 300

ata gaa ggg ctg tgg tct atg aac ttc acg ttt aac aaa gaa gac act 960
 Ile Glu Gly Leu Trp Ser Met Asn Phe Thr Phe Asn Lys Glu Asp Thr
 305 310 315 320

gag atc gag ggc ctg gaa gtg cct ttc att gat tct ctc tac gag ttc 1008
 Glu Ile Glu Gly Leu Glu Val Pro Phe Ile Asp Ser Leu Tyr Glu Phe
 325 330 335

aat att ctt caa aag atc aat gac tgt ggg ggt tgc act act ttc acc 1056
 Asn Ile Leu Gln Lys Ile Asn Asp Cys Gly Gly Cys Thr Thr Phe Thr
 340 345 350

cac cta agt ttc cag gag ttt ttt gca gcc atg tcc ttt gtg cta gag 1104
 His Leu Ser Phe Gln Glu Phe Phe Ala Ala Met Ser Phe Val Leu Glu
 355 360 365

gaa cct aga gaa ttc cct ccc cat tcc aca aag cca caa gag atg aag 1152
 Glu Pro Arg Glu Phe Pro Pro His Ser Thr Lys Pro Gln Glu Met Lys
 370 375 380

atg tta ctg caa cac gtc ttg ctt gac aaa gaa gcc tac tgg act cca 1200
 Met Leu Leu Gln His Val Leu Leu Asp Lys Glu Ala Tyr Trp Thr Pro
 385 390 395 400

gtg gtt ctg ttc ttc ttt ggt ctt tta aat aaa aac ata gca aga gaa 1248
 Val Val Leu Phe Phe Phe Gly Leu Leu Asn Lys Asn Ile Ala Arg Glu
 405 410 415

ctg gaa gat act ttg cat tgt aaa ata tct ccc agg gta atg gag gaa 1296
 Leu Glu Asp Thr Leu His Cys Lys Ile Ser Pro Arg Val Met Glu Glu
 420 425 430

tta tta aag tgg gga gaa gag tta ggt aag gct gaa agt gcc tct ctc 1344
 Leu Leu Lys Trp Gly Glu Glu Leu Gly Lys Ala Glu Ser Ala Ser Leu
 435 440 445

caa ttt cac att cta cga ctt ttt cac tgc cta cac gag tcc cag gag 1392
 Gln Phe His Ile Leu Arg Leu Phe His Cys Leu His Glu Ser Gln Glu
 450 455 460

A1

gaa gac ttc aca aag aag atg ttg ggt cgt atc ttt gaa gtt gac ctt 1440
 Glu Asp Phe Thr Lys Lys Met Leu Gly Arg Ile Phe Glu Val Asp Leu
 465 470 475 480

aat att ttg gag gac gaa gaa ctc caa gct tct tca ttt tgc cta aag 1488
 Asn Ile Leu Glu Asp Glu Glu Leu Gln Ala Ser Ser Phe Cys Leu Lys
 485 490 495

cac tgt aaa agg tta aat aag cta agg ctt tct gtt agc agt cac atc 1536
 His Cys Lys Arg Leu Asn Lys Leu Arg Leu Ser Val Ser Ser His Ile
 500 505 510

ctt gaa agg gac ttg gaa att ctg gag tga 1566
 Leu Glu Arg Asp Leu Glu Ile Leu Glu
 515 520

<210> 6

<211> 521

<212> PRT

<213> Homo sapiens

<400> 6

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 Asp His Val Tyr Ile Arg Asn Thr Ser Lys Asp Glu His Glu Glu Leu
 20 25 30
 Gln Arg Leu Leu Asp Pro Asn Arg Thr Arg Ala Gln Ala Gln Thr Ile
 35 40 45
 Val Leu Val Gly Arg Ala Gly Val Gly Lys Thr Thr Leu Ala Met Gln
 50 55 60
 Ala Met Leu His Trp Ala Asn Gly Val Leu Phe Gln Gln Arg Phe Ser
 65 70 75 80
 Tyr Val Phe Tyr Leu Ser Cys His Lys Ile Arg Tyr Met Lys Glu Thr
 85 90 95
 Thr Phe Ala Glu Leu Ile Ser Leu Asp Trp Pro Asp Phe Asp Ala Pro
 100 105 110
 Ile Glu Glu Phe Met Ser Gln Pro Glu Lys Leu Leu Phe Ile Ile Asp
 115 120 125
 Gly Phe Glu Glu Ile Ile Ile Ser Glu Ser Arg Ser Glu Ser Leu Asp
 130 135 140
 Asp Gly Ser Pro Cys Thr Asp Trp Tyr Gln Glu Leu Pro Val Thr Lys
 145 150 155 160
 Ile Leu His Ser Leu Leu Lys Lys Glu Leu Val Pro Leu Ala Thr Leu
 165 170 175
 Leu Ile Thr Ile Lys Thr Trp Phe Val Arg Asp Leu Lys Ala Ser Leu
 180 185 190
 Val Asn Pro Cys Phe Val Gln Ile Thr Gly Phe Thr Gly Asp Asp Leu
 195 200 205
 Arg Val Tyr Phe Met Arg His Phe Asp Asp Ser Ser Glu Val Glu Lys
 210 215 220
 Ile Leu Gln Gln Leu Arg Lys Asn Glu Thr Leu Phe His Ser Cys Ser
 225 230 235 240
 Ala Pro Met Val Cys Trp Thr Val Cys Ser Cys Leu Lys Gln Pro Lys
 245 250 255
 Val Arg Tyr Tyr Asp Leu Gln Ser Ile Thr Gln Thr Thr Thr Ser Leu
 260 265 270

A1

Tyr Ala Tyr Phe Phe Ser Asn Leu Phe Ser Thr Ala Glu Val Asp Leu
 275 280 285
 Ala Asp Asp Ser Trp Pro Gly Gln Trp Arg Ala Leu Cys Ser Leu Ala
 290 295 300
 Ile Glu Gly Leu Trp Ser Met Asn Phe Thr Phe Asn Lys Glu Asp Thr
 305 310 315 320
 Glu Ile Glu Gly Leu Glu Val Pro Phe Ile Asp Ser Leu Tyr Glu Phe
 325 330 335
 Asn Ile Leu Gln Lys Ile Asn Asp Cys Gly Gly Cys Thr Thr Phe Thr
 340 345 350
 His Leu Ser Phe Gln Glu Phe Phe Ala Ala Met Ser Phe Val Leu Glu
 355 360 365
 Glu Pro Arg Glu Phe Pro Pro His Ser Thr Lys Pro Gln Glu Met Lys
 370 375 380
 Met Leu Leu Gln His Val Leu Leu Asp Lys Glu Ala Tyr Trp Thr Pro
 385 390 395 400
 Val Val Leu Phe Phe Phe Gly Leu Leu Asn Lys Asn Ile Ala Arg Glu
 405 410 415
 Leu Glu Asp Thr Leu His Cys Lys Ile Ser Pro Arg Val Met Glu Glu
 420 425 430
 Leu Leu Lys Trp Gly Glu Glu Leu Gly Lys Ala Glu Ser Ala Ser Leu
 435 440 445
 Gln Phe His Ile Leu Arg Leu Phe His Cys Leu His Glu Ser Gln Glu
 450 455 460
 Glu Asp Phe Thr Lys Lys Met Leu Gly Arg Ile Phe Glu Val Asp Leu
 465 470 475 480
 Asn Ile Leu Glu Asp Glu Glu Leu Gln Ala Ser Ser Phe Cys Leu Lys
 485 490 495
 His Cys Lys Arg Leu Asn Lys Leu Arg Leu Ser Val Ser Ser His Ile
 500 505 510
 Leu Glu Arg Asp Leu Glu Ile Leu Glu
 515 520

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 <212> DNA
 <213> Homo sapiens

<220>
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 <222> (2)...(2575)

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 Ser Arg Leu Trp Ser Ser Lys Ser Val Thr Glu Ile His Leu Tyr Phe
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 gag gag gaa gtc aag caa gaa gaa tgt gac cat ttg gac cgc ctt ttt 97
 Glu Glu Glu Val Lys Gln Glu Glu Cys Asp His Leu Asp Arg Leu Phe
 20 25 30

 gct ccc aag gaa gct ggg aaa cag cca cgt aca gtg atc att caa gga 145
 Ala Pro Lys Glu Ala Gly Lys Gln Pro Arg Thr Val Ile Ile Gln Gly
 35 40 45

cca caa gga att gga aaa acg aca ctc ctg atg aag ctg atg atg gcc 193
Pro Gln Gly Ile Gly Lys Thr Thr Leu Leu Met Lys Leu Met Met Ala
50 55 60

tgg tcg gac aac aag atc ttt cgg gat agg ttc ctg tac acg ttc tat 241
Trp Ser Asp Asn Lys Ile Phe Arg Asp Arg Phe Leu Tyr Thr Phe Tyr
65 70 75 80

ttc tgc tgc aga gaa ctg agg gag ttg ccg cca acg agt ttg gct gac 289
Phe Cys Cys Arg Glu Leu Arg Glu Leu Pro Pro Thr Ser Leu Ala Asp
85 90 95

ttg att tcc aga gag tgg cct gac ccc gct gct cct ata aca gag atc 337
Leu Ile Ser Arg Glu Trp Pro Asp Pro Ala Ala Pro Ile Thr Glu Ile
100 105 110

gtg tct caa ccg gag aga ctc ttg ttc gtc atc gac agc ttc gaa gag 385
Val Ser Gln Pro Glu Arg Leu Leu Phe Val Ile Asp Ser Phe Glu Glu
115 120 125

ctg cag ggc ggc ttg aac gaa ccc gat tcg gat ctg tgt ggt gac ttg 433
Leu Gln Gly Gly Leu Asn Glu Pro Asp Ser Asp Leu Cys Gly Asp Leu
130 135 140

atg gag aaa cgg ccg gtg cag gtg ctt ctg agc agt ttg ctg agg aag 481
Met Glu Lys Arg Pro Val Gln Val Leu Leu Ser Ser Leu Leu Arg Lys
145 150 155 160

aag atg ctc ccg gag gcc tcc ctg ctc atc gct atc aaa ccc gtg tgc 529
Lys Met Leu Pro Glu Ala Ser Leu Leu Ile Ala Ile Lys Pro Val Cys
165 170 175

ccg aag gag ctc ccg gat cag gtg acg atc tca gaa atc tac cag ccc 577
Pro Lys Glu Leu Arg Asp Gln Val Thr Ile Ser Glu Ile Tyr Gln Pro
180 185 190

cgg gga ttc aac gag agt gat agg tta gtg tat ttc tgc tgt ttc ttc 625
Arg Gly Phe Asn Glu Ser Asp Arg Leu Val Tyr Phe Cys Cys Phe Phe
195 200 205

aaa gac ccg aaa aga gcc atg gaa gcc ttc aat ctt gta aga gaa agt 673
Lys Asp Pro Lys Arg Ala Met Glu Ala Phe Asn Leu Val Arg Glu Ser
210 215 220

gaa cag ctg ttt tcc ata tgc caa atc ccg ctc ctc tgc tgg atc ctg 721
Glu Gln Leu Phe Ser Ile Cys Gln Ile Pro Leu Leu Cys Trp Ile Leu
225 230 235 240

tgt acc agt ctg aag caa gag atg cag aaa gga aaa gac ctg gcc ctg 769
Cys Thr Ser Leu Lys Gln Glu Met Gln Lys Gly Lys Asp Leu Ala Leu
245 250 255

acc tgc cag agc act acc tct gtg tac tcc tct ttc gtc ttt aac ctg 817
Thr Cys Gln Ser Thr Thr Ser Val Tyr Ser Ser Phe Val Phe Asn Leu
260 265 270

A1

ttc aca cct gag ggt gcc gag ggc ccg act ccg caa acc cag cac cag	865
Phe Thr Pro Glu Gly Ala Glu Gly Pro Thr Pro Gln Thr Gln His Gln	
275 280 285	
ctg aag gcc ctg tgc tcc ctg gct gca gag ggt atg tgg aca gac aca	913
Leu Lys Ala Leu Cys Ser Leu Ala Ala Glu Gly Met Trp Thr Asp Thr	
290 295 300	
ttt gag ttt tgt gaa gac gac ctc cgg aga aat ggg gtt gtt gac gct	961
Phe Glu Phe Cys Glu Asp Asp Leu Arg Arg Asn Gly Val Val Asp Ala	
305 310 315 320	
gac atc cct gcg ctg ctg gcc acc aag ata ctt ctg aag tac ggg gag	1009
Asp Ile Pro Ala Leu Leu Gly Thr Lys Ile Leu Leu Lys Tyr Gly Glu	
325 330 335	
cgt gag agc tcc tac gtg ttc ctc cac gtg tgt atc cag gag ttc tgt	1057
Arg Glu Ser Ser Tyr Val Phe Leu His Val Cys Ile Gln Glu Phe Cys	
340 345 350	
gcc gcc ttg ttc tat ttg ctc aag agc cac ctt gat cat cct cac cca	1105
Ala Ala Leu Phe Tyr Leu Leu Lys Ser His Leu Asp His Pro His Pro	
355 360 365	
gct gtg aga tgt gta cag gaa ttg cta gtt gcc aat ttt gaa aaa gca	1153
Ala Val Arg Cys Val Gln Glu Leu Leu Val Ala Asn Phe Glu Lys Ala	
370 375 380	
agg aga gca cat tgg att ttt ttg ggg tgt ttt cta act ggc ctt tta	1201
Arg Arg Ala His Trp Ile Phe Leu Gly Cys Phe Leu Thr Gly Leu Leu	
385 390 395 400	
aat aaa aag gaa caa gaa aaa ctg gat gcg ttt ttt ggc ttc caa ctg	1249
Asn Lys Lys Glu Gln Glu Lys Leu Asp Ala Phe Phe Gly Phe Gln Leu	
405 410 415	
tcc caa gag ata aag cag caa att cac cag tgc ctg aag agc tta ggg	1297
Ser Gln Glu Ile Lys Gln Gln Ile His Gln Cys Leu Lys Ser Leu Gly	
420 425 430	
gag cgt ggc aat cct cag gga cag gtg gat tcc ttg gcg ata ttt tac	1345
Glu Arg Gly Asn Pro Gln Gly Gln Val Asp Ser Leu Ala Ile Phe Tyr	
435 440 445	
tgt ctc ttt gaa atg cag gat cct gcc ttt gtg aag cag gca gtg aac	1393
Cys Leu Phe Glu Met Gln Asp Pro Ala Phe Val Lys Gln Ala Val Asn	
450 455 460	
ctc ctc caa gaa gct aac ttt cat att att gac aac gtg gac ttg gtg	1441
Leu Leu Gln Glu Ala Asn Phe His Ile Ile Asp Asn Val Asp Leu Val	
465 470 475 480	
gtt tct gcc tac tgc tta aaa tac tgc tcc agc ttg agg aaa ctc tgt	1489
Val Ser Ala Tyr Cys Leu Lys Tyr Cys Ser Ser Leu Arg Lys Leu Cys	
485 490 495	

A1

ttt tcc gtt caa aat gtc ttt aag aaa gag gat gaa cac agc tct acg 1537
 Phe Ser Val Gln Asn Val Phe Lys Lys Glu Asp Glu His Ser Ser Thr
 500 505 510

tcg gat tac agc ctc atc tgt tgg cat cac atc tgc tct gtg ctc acc 1585
 Ser Asp Tyr Ser Leu Ile Cys Trp His His Ile Cys Ser Val Leu Thr
 515 520 525

acc agc ggg cac ctc aga gag ctc cag gtg cag gac agc acc ctc agc 1633
 Thr Ser Gly His Leu Arg Glu Leu Gln Val Gln Asp Ser Thr Leu Ser
 530 535 540

gag tcg acc ttt gtg acc tgg tgt aac cag ctg agg cat ccc agc tgt 1681
 Glu Ser Thr Phe Val Thr Trp Cys Asn Gln Leu Arg His Pro Ser Cys
 545 550 555 560

cgc ctt cag aag ctt gga ata aat aac gtt tcc ttt tct ggc cag agt 1729
 Arg Leu Gln Lys Leu Gly Ile Asn Asn Val Ser Phe Ser Gly Gln Ser
 565 570 575

gtt ctg ctc ttt gag gtg ctc ttt tat cag cca gac ttg aaa tac ctg 1777
 Val Leu Leu Phe Glu Val Leu Phe Tyr Gln Pro Asp Leu Lys Tyr Leu
 580 585 590

agc ttc acc ctc acg aaa ctc tct cgt gat gac atc agg tcc ctc tgt 1825
 Ser Phe Thr Leu Thr Lys Leu Ser Arg Asp Asp Ile Arg Ser Leu Cys
 595 600 605

A1 gat gcc ttg aac tac cca gca ggc aac gtc aaa gag cta gcg ctg gta 1873
 Asp Ala Leu Asn Tyr Pro Ala Gly Asn Val Lys Glu Leu Ala Leu Val
 610 615 620

aat tgt cac ctc tca ccc att gat tgt gaa gtc ctt gct ggc ctt cta 1921
 Asn Cys His Leu Ser Pro Ile Asp Cys Glu Val Leu Ala Gly Leu Leu
 625 630 635 640

acc aac aac aag aag ctg acg tat ctg aat gta tcc tgc aac cag tta 1969
 Thr Asn Asn Lys Lys Leu Thr Tyr Leu Asn Val Ser Cys Asn Gln Leu
 645 650 655

gac aca ggc gtg ccc ctt ttg tgt gaa gcc ctg tgc agc cca gac acg 2017
 Asp Thr Gly Val Pro Leu Leu Cys Glu Ala Leu Cys Ser Pro Asp Thr
 660 665 670

gtc ctg gta tac ctg atg ttg gct ttc tgc cac ctc agc gag cag tgc 2065
 Val Leu Val Tyr Leu Met Leu Ala Phe Cys His Leu Ser Glu Gln Cys
 675 680 685

tgc gaa tac atc tct gaa atg ctt ctg cgt aac aag agc gtg cgc tat 2113
 Cys Glu Tyr Ile Ser Glu Met Leu Leu Arg Asn Lys Ser Val Arg Tyr
 690 695 700

cta gac ctc agt gcc aat gtc ctg aag gac gaa gga ctg aaa act ctc 2161
 Leu Asp Leu Ser Ala Asn Val Leu Lys Asp Glu Gly Leu Lys Thr Leu
 705 710 715 720

tgc gag gcc ttg aaa cat ccg gac tgc tgc ctg gat tca ctg tgt ttg 2209
 Cys Glu Ala Leu Lys His Pro Asp Cys Cys Leu Asp Ser Leu Cys Leu
 725 730 735

gta aaa tgt ttt atc act gct gct ggc tgt gaa gac ctc gcc tct gct 2257
 Val Lys Cys Phe Ile Thr Ala Ala Gly Cys Glu Asp Leu Ala Ser Ala
 740 745 750

ctc atc agc aat caa aac ctg aag att ctg caa att ggg tgc aat gaa 2305
 Leu Ile Ser Asn Gln Asn Leu Lys Ile Leu Gln Ile Gly Cys Asn Glu
 755 760 765

atc gga gat gtg ggt gtg cag ctg ttg tgt cgg gct ctg acg cat acg 2353
 Ile Gly Asp Val Gly Val Gln Leu Leu Cys Arg Ala Leu Thr His Thr
 770 775 780

gat tgc cgc tta gag att ctt ggg ttg gaa gaa tgt ggg tta acg agc 2401
 Asp Cys Arg Leu Glu Ile Leu Gly Leu Glu Glu Cys Gly Leu Thr Ser
 785 790 795 800

acc tgc tgt aag gat ctc gcg tct gtt ctc acc tgc agt aag acc ctg 2449
 Thr Cys Cys Lys Asp Leu Ala Ser Val Leu Thr Cys Ser Lys Thr Leu
 805 810 815

cag cag ctc aac ctg acc ttg aac acc ttg gac cac aca ggg gtg gtt 2497
 Gln Gln Leu Asn Leu Thr Leu Asn Thr Leu Asp His Thr Gly Val Val
 820 825 830

gta ctc tgt gag gcc ctg aga cac cca gag tgt gcc ctg cag gtg ctc 2545
 Val Leu Cys Glu Ala Leu Arg His Pro Glu Cys Ala Leu Gln Val Leu
 835 840 845

ggg gtt gtt gca gga gta aga acc aag cag 2575
 Gly Val Val Ala Gly Val Arg Thr Lys Gln
 850 855

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 <212> PRT
 <213> Homo sapiens

<400> 8
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 20 25 30
 Ala Pro Lys Glu Ala Gly Lys Gln Pro Arg Thr Val Ile Ile Gln Gly
 35 40 45
 Pro Gln Gly Ile Gly Lys Thr Thr Leu Leu Met Lys Leu Met Met Ala
 50 55 60
 Trp Ser Asp Asn Lys Ile Phe Arg Asp Arg Phe Leu Tyr Thr Phe Tyr
 65 70 75 80
 Phe Cys Cys Arg Glu Leu Arg Glu Leu Pro Pro Thr Ser Leu Ala Asp
 85 90 95
 Leu Ile Ser Arg Glu Trp Pro Asp Pro Ala Ala Pro Ile Thr Glu Ile
 100 105 110

A1

Val Ser Gln Pro Glu Arg Leu Leu Phe Val Ile Asp Ser Phe Glu Glu
 115 120 125
 Leu Gln Gly Gly Leu Asn Glu Pro Asp Ser Asp Leu Cys Gly Asp Leu
 130 135 140
 Met Glu Lys Arg Pro Val Gln Val Leu Leu Ser Ser Leu Leu Arg Lys
 145 150 155 160
 Lys Met Leu Pro Glu Ala Ser Leu Leu Ile Ala Ile Lys Pro Val Cys
 165 170 175
 Pro Lys Glu Leu Arg Asp Gln Val Thr Ile Ser Glu Ile Tyr Gln Pro
 180 185 190
 Arg Gly Phe Asn Glu Ser Asp Arg Leu Val Tyr Phe Cys Cys Phe Phe
 195 200 205
 Lys Asp Pro Lys Arg Ala Met Glu Ala Phe Asn Leu Val Arg Glu Ser
 210 215 220
 Glu Gln Leu Phe Ser Ile Cys Gln Ile Pro Leu Leu Cys Trp Ile Leu
 225 230 235 240
 Cys Thr Ser Leu Lys Gln Glu Met Gln Lys Gly Lys Asp Leu Ala Leu
 245 250 255
 Thr Cys Gln Ser Thr Thr Ser Val Tyr Ser Ser Phe Val Phe Asn Leu
 260 265 270
 Phe Thr Pro Glu Gly Ala Glu Gly Pro Thr Pro Gln Thr Gln His Gln
 275 280 285
 Leu Lys Ala Leu Cys Ser Leu Ala Ala Glu Gly Met Trp Thr Asp Thr
 290 295 300
 Phe Glu Phe Cys Glu Asp Asp Leu Arg Arg Asn Gly Val Val Asp Ala
 305 310 315 320
 Asp Ile Pro Ala Leu Leu Gly Thr Lys Ile Leu Leu Lys Tyr Gly Glu
 325 330 335
 Arg Glu Ser Ser Tyr Val Phe Leu His Val Cys Ile Gln Glu Phe Cys
 340 345 350
 Ala Ala Leu Phe Tyr Leu Leu Lys Ser His Leu Asp His Pro His Pro
 355 360 365
 Ala Val Arg Cys Val Gln Glu Leu Leu Val Ala Asn Phe Glu Lys Ala
 370 375 380
 Arg Arg Ala His Trp Ile Phe Leu Gly Cys Phe Leu Thr Gly Leu Leu
 385 390 395 400
 Asn Lys Lys Glu Gln Glu Lys Leu Asp Ala Phe Phe Gly Phe Gln Leu
 405 410 415
 Ser Gln Glu Ile Lys Gln Gln Ile His Gln Cys Leu Lys Ser Leu Gly
 420 425 430
 Glu Arg Gly Asn Pro Gln Gly Gln Val Asp Ser Leu Ala Ile Phe Tyr
 435 440 445
 Cys Leu Phe Glu Met Gln Asp Pro Ala Phe Val Lys Gln Ala Val Asn
 450 455 460
 Leu Leu Gln Glu Ala Asn Phe His Ile Ile Asp Asn Val Asp Leu Val
 465 470 475 480
 Val Ser Ala Tyr Cys Leu Lys Tyr Cys Ser Ser Leu Arg Lys Leu Cys
 485 490 495
 Phe Ser Val Gln Asn Val Phe Lys Lys Glu Asp Glu His Ser Ser Thr
 500 505 510
 Ser Asp Tyr Ser Leu Ile Cys Trp His His Ile Cys Ser Val Leu Thr
 515 520 525
 Thr Ser Gly His Leu Arg Glu Leu Gln Val Gln Asp Ser Thr Leu Ser
 530 535 540
 Glu Ser Thr Phe Val Thr Trp Cys Asn Gln Leu Arg His Pro Ser Cys
 545 550 555 560

A1

A1

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1 5 10 15

Glu Gly Ala Arg Ala Leu Ala Glu Ala Leu Lys Ser
 20 25

<210> 11
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 Met Thr Ser Pro Gln Leu Glu Trp Thr Leu Leu Glu Gln
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 ctg aac gag gat gaa tta aag agt ttc aaa tcc ctt tta tgg gct ttt 154
 Leu Asn Glu Asp Glu Leu Lys Ser Phe Lys Ser Leu Leu Trp Ala Phe
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 Thr Glu Leu Cys Lys Met Ala Lys Ala Glu Met Met Glu Asp Gly Gln
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 Val Gln Glu Ile Asp Asn Pro Glu Leu Gly Asp Ala Glu Glu Asp Ser
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 gag tta gca aag cca ggt gaa aag gaa gga tgg aga aat tca atg gag 442
 Glu Leu Ala Lys Pro Gly Glu Lys Glu Gly Trp Arg Asn Ser Met Glu
 115 120 125

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A1

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acc ctg gca ggg cac atc gag tgg gaa cgc acg atg atg ctg atg ctg 2314
 Thr Leu Ala Gly His Ile Glu Trp Glu Arg Thr Met Met Leu Met Leu
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 Cys Asp Leu Leu Arg Asn His Lys Cys Asn Leu Gln Tyr Leu Arg Leu
 755 760 765

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 770 775 780

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 785 790 795 800

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 835 840 845

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 850 855 860

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 930 935 940

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 945 950 955 960

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 Asp Phe Phe Cys
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 Asn Trp Ile Arg Asn Ala Thr Val Asn Ile Leu Glu Glu Met Asn Leu
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 85 90 95
 Val Gln Glu Ile Asp Asn Pro Glu Leu Gly Asp Ala Glu Glu Asp Ser
 100 105 110
 Glu Leu Ala Lys Pro Gly Glu Lys Glu Gly Trp Arg Asn Ser Met Glu
 115 120 125
 Lys Gln Ser Leu Val Trp Lys Asn Thr Phe Trp Gln Gly Asp Ile Asp
 130 135 140
 Asn Phe His Asp Asp Val Thr Leu Arg Asn Gln Arg Phe Ile Pro Phe
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 Leu Asn Pro Arg Thr Pro Arg Lys Leu Thr Pro Tyr Thr Val Val Leu
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 His Gly Pro Ala Gly Val Gly Lys Thr Thr Leu Ala Lys Lys Cys Met
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 195 200 205
 Tyr Leu Ser Cys Lys Glu Leu Ser Arg Met Gly Pro Cys Ser Phe Ala
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 Glu Leu Ile Ser Lys Asp Trp Pro Glu Leu Gln Asp Asp Ile Pro Ser
 225 230 235 240
 Ile Leu Ala Gln Ala Gln Arg Ile Leu Phe Val Val Asp Gly Leu Asp
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 Glu Leu Lys Val Pro Pro Gly Ala Leu Ile Gln Asp Ile Cys Gly Asp
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 Val Cys Thr Thr Leu Lys Leu Gln Met Glu Lys Gly Glu Asp Pro Val
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 385 390 395 400
 Arg Phe Pro Gln Gly Ala Gln Leu Arg Gly Ala Leu Arg Thr Leu Ser
 405 410 415
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 420 425 430

A1

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 465 470 475 480
 Ala Leu Glu Lys Glu Glu Gly Glu Asp Arg Asp Gly His Ala Trp Asp
 485 490 495
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 Pro Asp Leu Ile Gln Val Gly His Phe Leu Phe Gly Leu Ala Asn Glu
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 Glu Ser Gln Glu Glu Glu Leu Ala Lys Val Val Val Ala Pro Phe Lys
 580 585 590
 Glu Ile Ser Ile His Leu Thr Asn Thr Ser Glu Val Met His Cys Ser
 595 600 605
 Phe Ser Leu Lys His Cys Gln Asp Leu Gln Lys Leu Ser Leu Gln Val
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 Ala Lys Gly Val Phe Leu Glu Asn Tyr Met Asp Phe Glu Leu Asp Ile
 625 630 635 640
 Glu Phe Glu Arg Cys Thr Tyr Leu Thr Ile Pro Asn Trp Ala Arg Gln
 645 650 655
 Asp Leu Arg Ser Leu Arg Leu Trp Thr Asp Phe Cys Ser Leu Phe Ser
 660 665 670
 Ser Asn Ser Asn Leu Lys Phe Leu Glu Val Lys Gln Ser Phe Leu Ser
 675 680 685
 Asp Ser Ser Val Arg Ile Leu Cys Asp His Val Thr Arg Ser Thr Cys
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 His Leu Gln Lys Val Glu Ile Lys Asn Val Thr Pro Asp Thr Ala Tyr
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 Cys Asp Leu Leu Arg Asn His Lys Cys Asn Leu Gln Tyr Leu Arg Leu
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 Gly Gly His Cys Ala Thr Pro Glu Gln Trp Ala Glu Phe Phe Tyr Val
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 835 840 845
 Thr His Leu Cys Leu Ala Lys Asn Pro Ile Gly Asp Thr Gly Val Lys
 850 855 860
 Phe Leu Cys Glu Gly Leu Ser Tyr Pro Asp Cys Lys Leu Gln Thr Leu
 865 870 875 880

A1

Val Leu Gln Gln Cys Ser Ile Thr Lys Leu Gly Cys Arg Tyr Leu Ser
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 Asn Gln Ile Ala Arg Gly Leu Trp Ile Leu Cys Gln Ala Leu Glu Asn
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A1

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Asn Leu Ser Asp Lys Glu Phe Gln Ser Phe Lys Lys Tyr Leu Ala Arg
20 25 30

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Lys Ile Leu Asp Phe Lys Leu Pro Gln Phe Pro Leu Ile Gln Met Thr
35 40 45

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50 55 60

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65 70 75 80

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85 90 95

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caa tta gcc tat gat tct acc agc tat tat tca gca aac aat ctc aat 336
Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn
100 105 110

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115 120 125

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A1

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 Ser Tyr Val Val His Leu Thr Ser His Glu Ile Asn Gln Met Thr Asn
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gat tgc tgc acg acc ttg cag ctg tgc aat ggc aag agg gag ata tat 816
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tta tgc tgg atc acg tgt act gtc ctg aag cgg cag atg gac aag ggg 960
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cgt gac ttc cag ctc tgc tgc caa aca ccc act gat cta cat gcc cac 1008
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 660 665 670

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 690 695 700

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 740 745 750

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gcc tct gtt ctt acc acc aac aaa aca cta gaa aga ctc aac ttg ctt 2496
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caa aat cac ttg ggc aat gat gga gtt gca aaa ctt ctt gag agc ttg 2544
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<400> 16

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 210 215 220
 Ser Leu Leu Lys Arg Lys Met Ala Pro Gly Cys Trp Phe Leu Ile Ser
 225 230 235 240

A1

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A1

Leu Met Lys Cys Asp Leu Arg Ala Ser Glu Cys Glu Glu Ile Ala Ser
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